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MOBILE TERMINAL HAVING MULTIPLE PERSONAL
INFORMATION MANAGEMENT FUNCTIONALITY

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TECHNICAL FIELD

The present invention relates to personal information managements (PIM) applications, and more particularly, to a
5 system and method for synchronizing multiple versions of a personal information management application with multiple remote servers.

BACKGROUND OF THE INVENTION

Mobile terminals such as laptop computers, mobile
10 telephones, personal data assistants and pagers have become common tools in modern society. Users of these devices

utilize personal information management (PIM) applications
such as an address books, calendars, or "to do" lists on their
mobile terminals. These PIM applications were originally
stand alone applications without synchronization to the
5 outside world. As PIM applications further developed, the
next generation of applications included the ability to
synchronize with a personal computer. This process is
referred to as local synchronization.

When using local synchronization, a user has a single
10 version of a PIM application on a personal computer which is
synchronized with a mobile terminal version of the PIM
application. Since the synchronization is local, the mobile
terminal version of the PIM application may only synchronize
with a single PC. A need has arisen for a mobile terminal PIM
15 application to be able to synchronize with multiple remote
computing devices or servers. This need has arisen because of
the ability of a PIM application to remotely synchronize with
a number of Internet servers. Users now desire to synchronize
a mobile terminal PIM application with several different
20 remote servers. Presently this is not possible.

SUMMARY OF THE INVENTION

The present invention overcomes the foregoing and other problems with a mobile terminal capable of synchronizing with multiple remote servers. The mobile terminal includes
5 transceiver circuitry enabling the mobile terminal to communicate with a PLMN network. A multiple PIM functionality within the mobile terminal enables the mobile terminal to synchronize with multiple remote servers and provide multiple versions of data with respect to a single PIM application.

10 Using the multiple PIM functionality, a mobile terminal may first obtain synchronization between a first version of a PIM application within the multiple PIM functionality and a first remote server. The mobile terminal next obtains synchronization between a second version of the PIM
15 application and a second remote server. Data from both the first and second remote servers may then be displayed by the mobile terminal.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus
20 of the present invention may be obtained by reference to the

following Detailed Description when taken in conjunction with the accompanying Drawings wherein:

FIGURE 1 is an illustration of a mobile terminal including the multiple PIM functionality of the present invention communicating with a plurality of remote servers;

FIGURES 2a-2c illustrate the manner in which data may be displayed from multiple remote servers on a display of the mobile terminal; and

FIGURE 3 illustrates a unified display of data from a plurality of remote servers on a display of the mobile terminal;

FIGURE 4 illustrates a configurable unified display showing personal and general information;

FIGURE 5 is a flow diagram illustrating the operation of the system illustrated in FIGURE 1; and

FIGURE 6 illustrates downloading of data between a pair of mobile terminals rather than from a remote server.

DETAILED DESCRIPTION

Referring now to FIGURE 1, there is illustrated a mobile terminal 10 which can synchronize with a plurality of remote servers 15. Synchronization may occur using a wireless link

20 between the mobile terminal 10 and a network 25, for example, a PLMN, which provide access to the Internet 30. The wireless link 20 between the mobile terminal 10 and the PLMN 25 is supported by transceiver circuitry 35 within the mobile
5 terminal 10. The mobile terminal 10 generates a synchronization link to the various remote servers 15 using the connection through the PLMN 25 and the Internet 30.

The mobile terminal 10 obtains synchronization with a plurality of remote servers 15 using the multiple personal
10 information management (PIM) functionality 40. The multiple PIM functionality 40 includes a plurality of separate versions of a PIM application 45. Each of these versions of the PIM application 45 has the capability of synchronizing with a separate server 15. Each of the versions of the PIM
15 application 45 includes separate synchronization data 50 enabling synchronization with the synchronization circuitry 55 included within each of the plurality of remote servers 15. The synchronization data 50a of a first version of the PIM application 45a enable this first version of the PIM
20 application 45a to synchronize with the server 15a using synchronization circuitry 55a. Likewise, version 45b may use synchronization data 50b to synchronize with remote server 15b

using synchronization circuit 55b. This process may continue with each version of the PIM application 45 synchronizing with a particular server 15.

5 The synchronization process enables data stored within the remote servers 15 to be downloaded to and displayed at the mobile terminal 35 on display 60. The data may be transferred in one embodiment using the vCalendar format, as described in "vCalendar - The Electronic Calendaring and Scheduling Exchange Format Version 1.0", September 16, 1996, which is
10 incorporated herein by reference. The mobile terminal 35 interprets the data in vCalendar format and displays the data in the format of the mobile terminal. If, for example, the multiple PIM functionality 40 within the mobile terminal 10 included versions of a PIM application 45 for displaying a PIM
15 calendar, the versions of the calendar application 45 would each be synchronized with a remote server such as YAHOO, MSN and Go.com. Data (i.e., dates) from each of these servers are downloaded and displayed on the display 60 of the mobile terminal 10. Each of the remote servers 15 include different
20 content. For instance, the Go.com server would provide information about, for example, new movies by Disney, while the MSN server would provide information about Microsoft

products. Other remote servers might provide local information about happenings in a user's hometown.

Referring now to FIGURES 2a-2c, there is provided one example of the manner in which the data may be displayed by the multiple PIM functionality 40. In FIGURES 2a-2c, the information from three different servers are displayed separately on three different screens of the mobile terminal 10. Thus, the information in FIGURE 2a could be displayed on the display 60 of the mobile terminal 10 at one time then by clicking or requesting a next screen the information illustrated in FIGURES 2b and 2c would be displayed.

Alternatively, as illustrated in FIGURE 3, the information from each of the remote servers 15 can be combined into a single unified display as illustrated. In this case, the calendar date information from the plurality of servers 15 are combined into a single calendar. Each of the three calendars could also be displayed together rather than displaying the data in a single calendar. A software program within the mobile terminal 10 combines the data into either of the described unified displays. It should be appreciated that while the discussion with respect to FIGURES 1, 2 and 3 have related to a PIM calendar functionality that any number of PIM

applications may be utilized in accordance with the present invention.

Referring now to FIGURE 4, there is illustrated a use of the present invention wherein a private calendar 100, which
5 may be customized by a user to provide a desired look to the display and desired information on the display. The customization may be performed by a user via a PC interconnected with the mobile terminal 10 or directly on the mobile terminal 10. The information displayed in the portion
10 of the calendar 100 shown in FIGURE 4 is divided into private appointments 105, shown in bold (alternative indications such as highlighting, italicizing or coloring may also be used as an indication), and general appointments 110 which are non-bolded. The private appointments 105 might comprise meetings
15 the user is to attend or other appointments personal to the user of the device containing the multiple PIM functionality 40. The general events 110 comprise information of a general nature of which the user might have an interest, for example, movies that are showing within the area, concert dates,
20 festival dates and the like. Rather than having a private calendar 100 that is updatable by the user, the calendar may also be configured for informative purposes wherein the

information is only displayed and is not manipulated or changed by the user.

The multiple PIM functionality 40 may have the calendar 100 set up such that a user's mobile terminal 10 would periodically download particular types of information which they desired to have stored on their calendar 100. For example, if the user were interested in movies, the user's calendar 100 could synchronize with a calendar providing movie information once a week. If the user were interested in concerts, the user's calendar 100 could synchronize once a month with the local symphony's website calendar. The user may predefine the servers with which their calendar 100 synchronizes and downloads.

The PIM functionality 40 may also be configured to provide updates if an event changes. For example, if a concert were canceled that the user had entered into their calendar, they would be provided with a special notification of the cancellation during a next synchronization. Also, if the user had downloaded particular information relating to their favorite television programs and a program were preempted or canceled for any reason, the user would be

provided with an update of this change in the TV schedule during a next synchronization.

Referring now to FIGURE 5, there is illustrated a functional block diagram of a method of operation of the system illustrated in FIGURE 1. Initially, a first version of the PIM application 45a within the multiple PIM functionality 40 obtains synchronization at step 80 with a first remote server 15a. After synchronization has been obtained between a first version of the PIM application and a first remote server, a second version of the PIM application 45b obtains synchronization at step 85 with a second remote server 15b. This process may continue for as many PIM modules 45 and servers 15 as are available. Information obtained from the synchronization of the first PIM version 45a and second PIM version 45b are presented at 90 on the display 60 of the mobile terminal 10 in either the separated or unified form as discussed previously with respect to FIGURES 2 and 3.

Referring now to FIGURE 6, there is illustrated an embodiment wherein data relating to, for example, a calendar, may be downloaded directly between a first mobile terminal 110 and a second mobile terminal 115 rather than from a remote server 100. In the example illustrated in FIGURE 6, the

mobile terminal 115 accesses data within mobile terminal 110
either directly via a communications link 120 using, for
example, a PLMN telecommunications system, Bluetooth
connection, infrared connection or any other wireline or
5 wireless technology, or alternatively, may access the mobile
terminal 110 via the Internet 105 using communications links
130 and 125.

Upon accessing the mobile terminal 110, the mobile
terminal 115 may download data, for example, a calendar to
10 provide access to all of the calendar data from mobile
terminal 110. This information may then be stored within a
calendar within the mobile terminal 115. Data from the remote
server 100 may also be downloaded to either of the mobile
terminals as described previously. Alternatively, the mobile
15 terminal 115 may merely add data to the calendar within mobile
terminal 110. This would involve uploading data from the
mobile terminal 115. Provision of access by the mobile
terminal 115 to the calendar data within mobile terminal 110
would be via some type of secure procedure which only enables
20 access to the calendar data within the mobile terminal 110 by
approved users.

The previous description is of a preferred embodiment for implementing the invention, and the scope of the invention should not necessarily be limited by this description. The scope of the present invention is instead defined by the
5 following claims.

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